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Original Article

Childhood Poisoning - Associated Factors and Clinical Profile in a Tertiary Care Hospital

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Abstract

Background: Acute poisoning is a common medical emergency in the pediatric unit. It is a common preventable cause of morbidity and mortality in children. Most of the poisoning in children less than five years of age is accidental. This study aimed to determine the associated factors and clinical profile of childhood poisoning.

Material & Methods: A cross-sectional descriptive study was carried out among 69 children aged six months to 12 years with a history of poisoning over six months. History, clinical examination, and details of the poisoning were obtained by using a structured questionnaire during admission. Analysis was done through standard statistical tests.

Result: Among the 69 children of poisoning, 92.8% were accidental, and 7.2% were suicidal. Most cases (79.7%) were from the 6 - 59 months age group with male-female ratio 1.7:1. Most of the fathers (65.2%) and mothers (75.4%) had primary education, and 75.4% were poor. The most common cause of the poisoning was insecticide (60.9%), and the poison was stored at an available site (91.3%) in an unsealed container (47.8%). Accidental poisoning was more common in younger age group (<5 years) in male (70.31%) patients with normal family relationships (78.1%), whereas suicidal poisoning was more common in older age group (>10 years) in females (80%) patient with h/o familial disharmony (60%).

Conclusion: Insecticides and kerosene were the common cause of poisoning. Most of the materials were stored in an unsafe place and stored in an attractive bottle. Poison should be stored in a safe home with a sealed container. Simple and active family preventive measures can reduce accidental poisoning.

Keywords: Poisoning, Childhood.

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Introduction

Acute poisoning in children is a significant public health problem and represents a frequent cause of admission in the pediatric ward.[1] However, the offending agent and the associated morbidity and mortality vary from place to place and change over a period of time.[2] Most of the poisoning in children is accidental, and most cases of accidental poisoning are preventable.[3] Children get poisoned accidentally because of their exploratory nature.[4] Technically, poison is any substance introduced

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into the living body that can produce ill-effects or even death by virtue of its local or constitutional effects or both. Administration of even a medicine, which is otherwise indented to cure a disease, may be referred to as poisoning if the dose and manner of use is not medically justified. Study reveals that 90% of toxic exposure in children occurs at home and mostly involve a single toxic substance whose ingestion is the most common route of poisoning, followed by inhalation, topical application, and IV/IM administration.[5,6] Various authors have proffered diverse recommendations on preventing and controlling accidental poisoning in children.[7] The incidence of childhood poisoning in various Studies ranges from 0.33% to 7.6%[8]. A study at Khulna Medical college showed that 4.7% of pediatric admission is due to acute poisoning.[9] Ingestion of kerosene is the most common cause of severe accidental poisoning in the developing world.[10] Easy availability of household fuel, medicine, clearing agents, etc., causes unwanted accidental poisoning and extra burden to society.[11] A study in India showed the commonest poison consumed was kerosene (50%), followed by acids/alkalis (13%) and pesticide/insecticide (6.02%).[12,13] Knowledge about the nature, magnitude and regional peculiarities of the problem is necessary for management.[14,15] In Bangladesh, most children, live in rural homes, and since most rural households engage in farming, children have high exposure rates to agricultural chemicals such as insecticides and rodenticides. In the urban setting, poisons are also commonly found in the form of cleaners and solvents.[16] Poisoning can have long-term psychological and physical consequences for children and may result in high societal costs.[17] Child-resistant packaging for medications and toxic chemicals and keeping poisons out of the reach of young children are preventive measures.[18,19] several epidemiological studies are emphasizing the implementation and improvement of preventive programs, which can be aided to a more significant extent by identifying high-risk circumstances, susceptible age groups, chemical substances, and commercial products involved in pediatric poisoning cases. [20,21]

So this study is undertaken to identify the associated factor and clinical profile of poisoning in childhood.

Materials and Methods

This was a cross-sectional descriptive type study that was carried out at the Department of Paediatrics in Rajshahi Medical College Hospital, Rajshahi, from February to July 2017. Purposive sampling was done. Total 69 children from 6 months to 12 years of age admitted in Rajshahi Medical College Hospital with h/o acute poisoning were included in the study. Patients with food poisoning, snake bite, chronic poisoning like arsenic and lead poisoning, and inorganic poisoning like OPC poisoning were excluded. Data were collected through face-to-face interviews with attendants using structured questionnaires and through examination of the patient done during admission. After editing, data were analyzed by using SPSS. Statistical analysis was done by chi-square test according to the study's objectives and level of significance of p-value <0.05.

Results

Among 69 poisoning cases, 79.7% were from the 6 - 59 months age group, 46 (66%) patients were male, and 23 (33%) were female. Occupation of father of 14(20.3%) patients were business, 8(11.6%) were service, 27(39.1%) were day labour, 20(29%) were farmer. Most of the fathers, 45 (65.2%), had primary education, followed by secondary 14 (20.3%), above secondary 5 (7.2%), and illiterate 5 (7.2%). The socioeconomic condition of most of the patients 52 (75.4%) were poor, 15 (21.7%) were middle class, and 2 (2.9%) were rich*. Mother was the caregiver of 67 (97.1%) children; grandmother was the caregiver of 1 (1.4%) patient. The commonest causes of the poisoning were insecticide 42 (60.9%), and other causes were volatile (kerosene and turpine) 16 (23.2%), medicine 7 (10.1%), plant 4 (5.8%). most poisoning were accidental 64 (92.8%) and 5 (7.2%) were suicidal. 21 (30.4%) patients were asymptomatic

and among symptomatic patients, 22 (31.9%) presented with neurological features, 7(10.1%) with gastrointestinal features, 7(10.1%) with respiratory features, 12 (17.4%) with multisystem involvement

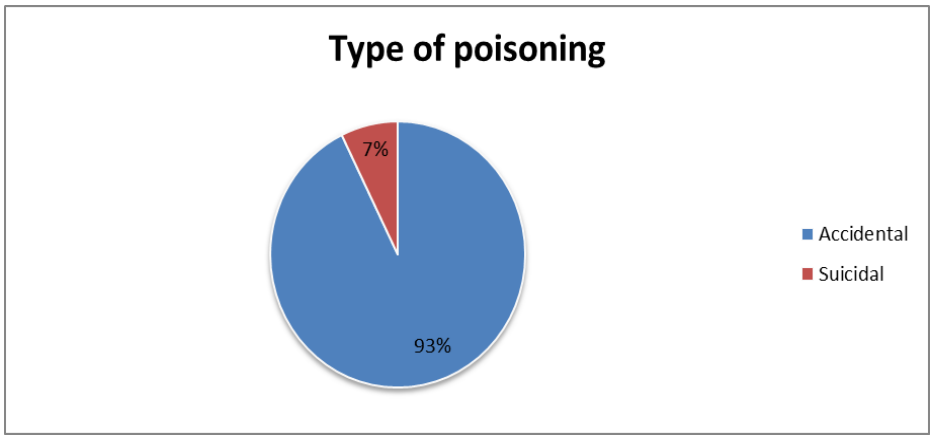

Figure 1: Distribution of the respondents according to the type of poisoning.

Table 1: Socio-demographic profile of the patients (n 69)

Characteristics of participants	Frequency	Percent(%)
Age distribution		
6-59 months	55	79.7
60-119 months	8	11.6
>120 months	6	8.7
Sex		
Male	46	67
Female	23	33
Father's literacy		
Illiterate	5	7.2
Primary	45	65.2
Secondary	14	20.3
Above	5	7.2
Father's occupation		
Farmer	20	29
Service holder	8	11.6
Businessman	14	20.3
Day labor	27	39.1

Socioeconomic condition		
Low/poor	52	75.4
Middle class	15	21.7
Rich	2	2.9
Caregiver		
Mother	67	97.1
Grandmother	1	1.4
Other	1	1.4

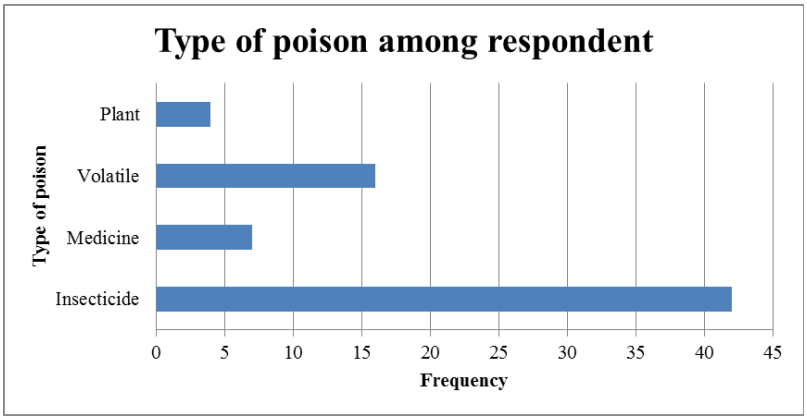

Figure 2: Type of poison among poisoning patients.

Table 2: Physical findings of the children

Physical findings	Frequency	Percent(%)
Altered consciousness	8	11.6
Abnormal Pupil	51	73.9
Raised temperature	16	23.2
Signs of resp. distress	8	11.6
Increased Sweating	3	4.3
Wheeze	4	5.8
Crackles	8	11.6
Increased Jerks	1	1.4
Increased Muscle tone	1	1.4
Abdominal distension	12	17.4
Bowel sound Absent	10	14.5

Poison was available in 63 (91.3%) patients, and in 6 (8.7%) patients, the poison was not available. Accidental poisoning was more common in younger age group (<5 years) in male (70.31%) patients with normal family relationships (78.1%). In contrast, suicidal poisoning was more common in the older age group (>10 years) in females (80%) patients with familial disharmony (60%) ($p < 0.05$). Both types of poisoning are more in poor socioeconomic conditions than in rich. The association between the type of poisoning and the parent's education, occupation, and caregiver is not statistically significant. ($p > 0.05$)

Table 3: Storage of poison

Storage of poison	**Frequency**	**Percent**
Sealed container	20	29.0
Unsealed container	33	47.8
Stored in an attractive bottle	16	23.2
Total	69	100.0

Table 4: Association between the cause of poisoning and age of the children

Age in months	Type of poisoning		Total	p-value
	Accidental n (%)	Suicidal n (%)	n(%)	
6-59	55 (85.9)	0(%)	55(79.7)	
60-119	7(10.9)	1(20.0)	8(11.6)	χ^2=36.144, df=2
>120	2(3.1)	4(80.0)	6(8.7)	p=0.000
Total	64(100)	5(100)	69(100)	

Table 5: Association between type of poisoning and sex of patient

Sex	Type of poisoning		Total	p-value
	Accidental n (%)	Suicidal n (%)	n(%)	
Male	45(70.31)	1(20.0)	46(66.66)	χ^2=5.28, df=1
Female	19(29.68)	4(80.0)	23(33.33)	p=0.021
Total	64(100)	5(100)	69(100)	

Table 6: Association between type of poisoning and family status

Family status	Type of poisoning		Total n(%)	p-value
	Accidental n(%)	Suicidal n(%)		
Disputes	8(12.5)	1(20.0)	9(13.0)	
Disharmony	6(9.4)	3(60.0)	9(13.0)	χ^2=11.432, df=2 p=0.003
Normal	50(78.1)	1(20.0)	51(73.9)	
Total	64(100)	5(100)	69(100)	

Table 7: Association between the type of poisoning and socioeconomic condition

Socio-economic condition	Type of poisoning		Total n(%)	p-value
	Accidental n(%)	Suicidal n(%)		
Low/poor	49(76.6)	3(60.0)	52(75.4)	χ^2=5.615, df=2 p=0.050
Middle class	14(21.9)	1(20.0)	15(21.7)	
Rich	1(1.6)	1(20.0)	2(2.9)	
Total	64(100)	5(100)	69(100)	

Discussion

The study was conducted among 69 poisoning patients to find out socio-demographic characteristics, associated factors, and clinical profiles. In this study, most of the poisoning cases were from the 6-59 months age group, and the male-female ratio was 2:1. These results were matched with a study by Keka Alije et al. in 2012, who found the absolute majority of the patients were under-five children with peak age three years with male-female ratio 1.5: 1.[1] Rashid et al. retrospectively studied to see the seasonal variation of acute poisoning in children in a tertiary hospital. In their study, 1-3 years was the most vulnerable age group to be affected ($p< .005$).[9]

In this study, most of the children came from a poor socioeconomic background, the father's occupation mainly was day labor (27) and farmer (20), and most fathers had primary education. The caregiver of all patients except 2 was the mother, but 18 have h/o domestic disputes and disharmony. A study by Rani et al. in 2008 found that lack of appropriate supervision and health awareness in the community is a significant contributory factor to the burden of acute poisoning in the pediatric age group. Nowneet K et al. in 2011 found among the 35 children with suicidal poisoning, an immediate precipitating factor was found in 26. It included arguments with family members (especially the father) in 19, the death of a parent in 5, and psychiatric illness in

2.[24] These findings about socio-demographic status differ from the current findings, which may be due to the difference in study population and place.

In the present study leading cause of the poisoning was insecticide and other causes were volatile (kerosene and turpine oil), medicine, and plant. Most poisonings were accidental (92.8%), and a few were suicidal. One retrospective study by Sridhar PV showed that most of the cases of poisoning were accidental (85.77%), kerosene was the most common compound (35.18%) responsible for the poisoning, followed by drugs and Organo phosphorus + Organochlorine compound [3]. A study by Ansam F in Palestine showed that the causative agents encountered were mainly biological agents (77.4%), pharmaceuticals, and other chemicals[4]. These findings differ from the current study due to different study places and the availability of poison. In this study, most patients took insecticide used for mango trees during the mango season. The main risk factor for poisoning was the easy availability of the poison and storage of poison in an unsealed container and attractive bottle. This finding matched a study by Ansam F et al., which showed that the risk factor of poisoning is storing medications at home in large quantities in places accessible to children, and un-regulated sale and use of chemicals and pesticides, especially among farmers. Cleaning products used at home are not in child-resistant containers and are stored under the sink or in the bathroom; the variety of chemicals available in the market, chemicals stored unsafely and within reach of children and do not have warning labeling regarding potential toxic effects.[4]

In this study 30.4% were asymptomatic. Among the symptomatic patients, the common symptoms were vomiting, the odor of poison, drolling of saliva, altered sensorium, fever, etc. Typical physical findings were abnormal pupil, raised temperature, abdominal distention, absent bowel sound, altered consciousness, respiratory distress, and crackles. A study by S Budhathoki et al. showed that the common features were vomiting, salivation, seizure, miosis, mydriasis, coma, crepitation in chest, tachypnea, diarrhoea, abdominal pain, respiratory failure , fever.[6] These findings were consistent to some extent with the current study.

This study showed a strong association of type of poisoning with age, sex, family relationship, and socioeconomic status ($p < 0.05$). Accidental poisoning was more common in the younger age group (<5 years), and Suicidal poisoning was more common in the older age group (>10 years). Accidental poisoning was more common in males, and suicidal poisoning was more common in females due to their emotional labiality. Accidental poisoning is more common in normal family relationships, and suicidal poisoning is more common in familial disharmony. In a study by Ansam F et al., there was a significant association between the type of poisoning (intentional versus unintentional) and gender, with females having more intentional poisoning than males (64.8% for females versus 35.2% for males, ($p < 0.001$). Intentional poisoning occurs in children more than six years (100%), and unintentional poisoning is common in younger children less than six years (65.5%) $p < 0.001$)[4]. These findings were consistent with the current study.

From this study, it is clear that poisoning is a significant burden to the community, and in most cases, it is preventable. We can easily avoid accidental poisoning by increasing awareness and modifying the responsible sociodemographic condition and risk factors. A larger scale study is needed for a better understanding of the problem.

Conclusion

Childhood poisoning is an important cause of hospitalization. Accidental poisoning is more common in the pediatric age group. Insecticides and kerosene were found to be the common cause of poisoning. Many accidental toxic exposures could be avoided by simple, active family preventive measures, using more resistant packaging, and locating these substances in places children do not have access. Effective health promotional programs for parents and careers regarding poisoning hazards are needed to increase

awareness and reduce the incidence of poisoning among children.

Conflict of interest: None declared

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